# Lay-Out Workers (Metal and Plastic)

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## What They Do

Lay-Out Workers trace patterns and mark specifications on metal or plastic stock for further processing. They use templates, measuring instruments, and hand tools, such as scribes, punches, or hand drills. They plan the layout based on blueprints and templates, applying their knowledge of trigonometry, product design, effects of heat, and allowances for curvature or thickness of material.

Titles used by employers in metal and plastic for Lay-Out Workers include: Composite Parts Worker, Aircraft Lay-Out Worker, Machine Lay-Out Worker, Pattern Lay-Out Worker, Precision Lay-Out Worker, Propeller Lay-Oout Worker, Ship Fitter, Lay-Out Person, Hangersmith. They work in architectural and structural metals, aerospace, and industrial machinery industries.

## Tasks

- Plan and develop layouts from blueprints and templates, applying knowledge of trigonometry, design, effects of heat, and properties of metals.
- Plan locations and sequences of cutting, drilling, bending, rolling, punching, and welding operations, using compasses, protractors, dividers, and rules.
- Add dimensional details to blueprints or drawings made by other workers.
- Compute layout dimensions, and determine and mark reference points on metal stock or workpieces for further processing, such as welding and assembly.
- Design and prepare templates of wood, paper, or metal.
- Fit and align fabricated parts to be welded or assembled.
- Lay out and fabricate metal structural parts such as plates, bulkheads, and frames.
- Locate center lines and verify template positions, using measuring instruments such as gauge blocks, height gauges, and dial indicators.
- Mark curves, lines, holes, dimensions, and welding symbols onto workpieces, using scribes, soapstones, punches, and hand drills.
- Apply pigment to layout surfaces, using paint brushes.

*Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.*

## Important Skills, Knowledge, and Abilities

- Mathematics — Using mathematics to solve problems.

EDD Employment Development Department State of California
LMID Labor Market Information Division "Your Information Source"

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- Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- Design — Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
- Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.

## Work Environment

Lay-Out Workers must be precise in performing their job to prevent material waste and ensure product quality. They stand most of the day, working indoors in plants with environments controlled for worker comfort and product quality. They must observe safety procedures around hazardous machinery and may wear personal protective equipment.

Some manufacturing plants operate around the clock, and workers may be required to work evening, night, or weekend shifts, as well as overtime when needed. As workers obtain seniority, they have more choice about shift assignments. Union membership may be available in some industries.

## California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

| Standard Occupational Classification | Estimated Number of Workers 2005 | Estimated Number of Workers 2014 | Average Annual Openings | 2006 Wage Range (per hour) |
|---|---|---|---|---|
| **Lay-Out Workers (Metal and Plastic)** | | | | |
| 51-4192 | 850 | Not Available | Not Available | $10.53 to $19.81 |

*Wages do not reflect self-employment.*
***Average annual openings** include new jobs plus net replacements.*
*Source: www.labormarketinfo.edd.ca.gov, OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.*

## Trends

The occupation of Lay-Out Workers will remain stable with no significant change compared with other occupations in California. Workers who develop Computer Numerical Controlled (CNC) skills will have the best opportunities.

## Training/Requirements/Apprenticeships

Most Lay-Out Workers receive on-the-job training, taking from one to twelve months. Community or vocational college certificate and degree programs in machine shop or machine technology are available in most areas of the state.

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**Recommended High School Course Work**
High school students interested in this kind of work should take mathematics including trigonometry, drafting, and physics, as well as any type of shop courses available.

## Where Do I Find the Job?

Direct application to employers remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search using keywords from the following manufacturing industry names to get a list of private firms and their addresses:

- Aircraft Engine and Engine Parts
- Aircraft
- Fabricated Structural Metal
- Guided Missiles and Space Vehicles
- Metal Window and Door
- Office Machinery
- Optical Instrument and Lens
- Ornamental and Architectural Metal Work
- Other Aircraft Parts and Equipment
- Other Commercial and Service Machinery
- Photographic and Photocopying Equipment
- Sheet Metal Work

Search these **yellow page** headings for listings of private firms:

- Die Makers
- Metal Cutting Tools
- Metal Fabricators
- Metal Stamping
- Plastic Fabricators
- Sheet Metal Work

## Where Can the Job Lead?

Opportunities for Lay-Out Workers' advancement could include supervision, depending on the size of the firm. With further education or training, workers could become Computer Numerical Controlled (CNC) Machine Operators, Machinists, or Tool and Die Makers.

## Other Sources of Information

Aluminum Extruders Council
www.aec.org

National Tooling & Machining Association
www.ntma.org

National Institute for Metalworking Skills
www.nims-skills.org

Precision Metalforming Association Educational Foundation
www.pmaef.org

The Society of the Plastics Industry
www.socplas.org

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